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ABSTRACT

Summaries of 18 different projects involving the use of satellite communications are presented in this report, including PEACESAT Education and Communication Experiments, USP Network Satellite Communication Project, Project Satellite, Satellite Instructional Television Experiment (SITE), Appalachian Education Satellite Program, Alaska Education Demonstration: ATS-6, Telemedicine in Alaska, Satellite Technology Demonstration (STD), WAMI Regionalized Medical Education Experiment, Veterans Administration Health Communications Experiment on ATS-6 and HERMES/CTS, University of Quebec Omnibus Network, University of Western Ontario Telemedicine (Moose Factory Experiment), Memorial University Telemedicine, Project Interchange: HERMES/CTS, Curriculum Sharing by Digital TV: HERMES/CTS, Interactive Broadband Communication Network: HERMES/CTS, Personnel Development by Satellite: HERMES/CTS, and WA-WA-TA Satellite Radio Project: HERMES/CTS. Each summary contains a description of the target audience, project objective, type of media used, donors/sponsors, duration of the project, and contact person. Descriptions and results of each project are given as well as references. (CHC)

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SATELLITE APPLICATIONS FOR PUBLIC SERVICE:

PROJECT SUMMARIES

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CLEARINGHOUSE ON DEVELOPMENT COMMUNICATION

PEACESAT EDUCATION AND COMMUNICATION EXPERIMENTS

Pacific Basin

TARGET AUDIENCE:	Educational institutions in twelve participating nations, most of which are located in the Pacific Basin
OBJECTIVE:	To link remote locations to central services through the application of communication technology designed to augment health, education, and community services
MEDIA:	ATS-1 satellite, two-way ground terminals, teletype, blackboard-by-wire, computer, and still-frame pictures
DONORS/SPONSORS:	U.S. National Aeronautics and Space Administration, University of Hawaii, Hawaii State Legislature, University of the South Pacific, South Pacific Commission, Carnegie Corporation of New York, and individual site participants
DURATION:	Planning and design began in 1969; system became operational in April 1971 and continues in operation today
CONTACT:	John Bystrom, Director, PEACESAT, University of Hawaii, Honolulu, Hawaii 96822, USA

DESCRIPTION:

Awareness that regional cooperation to upgrade health, education, and community services depends heavily on communication between major centers and fields of action prompted Pacific Basin planners to begin discussions with NASA in 1969 of a telecommunications system that would help support regional development efforts. By 1970 NASA had approved the use of the ATS-1 satellite for PEACESAT (Pan-Pacific Education and Communication Experiments by Satellite). In 1971 pilot terminals established in Hilo and Honolulu, Hawaii, were linked to the satellite, which still serves as the central relay point linking 16 two-way ground communication terminals in 12 nations.

These ground terminals, coordinated with the system in Honolulu, operate in New Zealand; Fiji; Kingdom of Tonga; Papua New Guinea; Trust Territory of the Pacific Islands; New Hebrides; Gilbert Islands; American Samoa; Western Samoa; Santa Cruz, California; and Sydney, Australia. Each terminal is operated by a government agency or regional educational institution, and system users prepare all exchange materials.

While initial funding was provided by numerous agencies and institutions, local institutions now meet capital and operating costs of the terminals. These costs remain low (the average cost of a terminal is $4,000), and, regulations in participating countries permitting, terminals can be interconnected with established telephone circuits or can operate side by side with existing telecommunications.

RESULTS:

Application of the PEACESAT system has provided support in the general areas of health and education, and in community service projects such as news exchange, dialogues between politicians and their constituencies, and interlibrary loans. During PEACESAT's first year of operation, a plan was developed for meeting interlibrary loan requests by facsimile or airmailed microfiche, thus allowing collections to be enlarged without the accompanying costs of acquisition and storage. A project providing for regional news exchange helped strengthen cooperative efforts among the participating nations, particularly in health and education, by increasing their understanding of each other's culture.

Of the various experiments conducted within the project, about one-third involved medical and health personnel. Users shared information regarding administrative planning, diagnostic consultations, public information on health education, and in-service training, with the opportunity for consultation through two-way transmission proving to be the most valuable application.

OF NOTE:

- During the epidemic of the dengue fever virus, the satellite link provided the opportunity to monitor progress, exchange information, transmit lab reports, and share treatment plans.
- A "Conference of PEACESAT Users," transmitted via ATS-1 in April 1975, made possible an interim evaluation of the first four years of the project.
- Users have found that links facilitated by satellite encourage mutual confidence among participants and decrease control by outside decision makers in planning public service programs.

REFERENCES:

"PEACESAT," by John Bystrom, in World Health, January 1978.

PEACESAT Project Networks Report Three, University of Hawaii, Honolulu, Hawaii, November 1975.

Clearinghouse on Development Communication
April 1979

USP NETWORK SATELLITE COMMUNICATION PROJECT

University of the South Pacific

TARGET AUDIENCE:	Academic and consumer populations of the countries of the South Pacific served by the University of the South Pacific
OBJECTIVES:	To determine the contribution of telecommunications to the development of a regional university
MEDIA:	ATS-1 satellite, two-way audio, audio tapes, print materials, local tutorials
DONORS/SPONSORS:	University of the South Pacific, Carnegie Corporation of New York, U.S. National Aeronautics and Space Administration, UNDP/UNESCO
DURATION:	Beginning February 1972, participated as part of PEACESAT Project; 1974, USPNetwork approved as independent project; Phase II extended through mid-1977, with proposal pending an extension through 1980
CONTACT:	John Chick, Director of Extension Services, University of the South Pacific, Suva, Fiji

DESCRIPTION:

The University of the South Pacific serves 11 small countries in the vast expanse of the South Pacific, an aggregate population of about 1.5 million widely-scattered people. Although these nations suffer the problems associated with resource limitations, they nonetheless want access to higher education. In addition to its educational mandate, the university has a major role to fulfill as a resource center for the region's other development programs. An effective telecommunications system is critical to the success of all of these efforts.

The university began its participation in satellite programs in February 1972 when it joined the PEACESAT (Pan-Pacific Educational and Communication Experiments by Satellite) project, at the invitation of the University of Hawaii. In 1973 the university made application to NASA for operation of its own experimental satellite program, and in January 1974 a separate time allocation on the ATS-1 satellite was given to the university, thus launching the USPNetwork Project (University of the South Pacific Network). This phase of the project was scheduled to extend through mid-1977; a May 1977 proposal requests a further extension through 1980, with a proposed link with the ATS-6 satellite which would add a video capability.

The main capability to date has been two-way voice transmission between terminals at university centers located at Suva, Fiji (the main terminal); Nuku'alofa, Tonga; Rarotonga, Cook Islands; Honiara, Solomon Islands; Nieu, Fiji; Tarawa, Gilbert and Ellice Islands; Port Vila, New Hebrides; and Apia, Western Samoa. Tuvalu and Nauru are also scheduled to participate in the network.

In its early phases, the project identified four areas for experimentation

using the satellite: 1) the external classroom, which included both courses conducted for credit and tutorial assistance; 2) curriculum development; 3) continuing education; and 4) administrative/information exchange. In the external classroom, students at all USP centers take credit courses by satellite, registering with the center for courses such as land tenure, sociology, introduction to government, accounting, mathematics, and English, and meeting via satellite with the course lecturer and other students at scheduled times. Special individual tutorial sessions with the instructor may be scheduled through the regional center. The continuing education experiment has focused heavily on teacher training but has also included community course offerings in contemporary problems, consumer education, nutrition and home economics, and family planning. The administrative/information exchange experiment has included regional administrative meetings, staff meetings and administration of finances, and it frequently expedites requests for information on course enrollment, equipment availability, textbook ordering, and the like.

RESULTS:

In 1976 the USPNetwork utilized 499 hours assigned by NASA on ATS-1, and an additional 132.26 hours through PEACESAT and multi-link experiments. The time allocation was fully utilized, and even so, external classroom course offerings and continuing education classes were provided at only a minimum level, considering the size of the university system and the diversity of the population it serves. Credit courses have been given top priority for use of satellite time--21 were offered in 1977--and regional administration is accorded second place. University center staff have become sophisticated users of the system, as have course tutors.

Beginning in 1975, about one hour per week was set aside for terminal repair, a reflection of the fact that the system uses low-cost terminals which require maintenance more often than high-powered installations in order to maintain a usable signal. Even so, power failures are a way of life in the Pacific, and transmissions are frequently interrupted.

Experience with the system has led to the conclusions that maximum course size per terminal is 25, optimum, 12; long speeches and lectures should be avoided, as students' minds tend to wander when there is no visual contact; and involvement and interaction must be emphasized to maintain interest.

Regional plans now center around an ongoing telecommunications network, using satellite, before 1985. Given the success of its experience thus far, the USPNetwork would undoubtedly be a part of such a system.

REFERENCES:

A Submission for a Satellite Communications Project, 1979-80, Volume 2: Appendices, University of the South Pacific Extension Services, Suva, Fiji, July 1978.

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April 1979

PROJECT SATELLITE

University of the West Indies

TARGET AUDIENCE:	Academic population of the University of the West Indies; residents of the West Indian region, specifically Barbados, Jamaica, and St. Lucia
OBJECTIVES:	To determine the feasibility of delivering outreach programs via satellite to widely scattered regions served by the University of the West Indies, and to determine the value of teleconferencing and video lectures for teaching, research, and administration
MEDIA:	Satellite, roof-type receiver/transmitter, television/radio link-up with two-way audio and visual transmission
DONORS/SPONSORS:	University of the West Indies, Agency for International Development, U.S. National Aeronautics and Space Administration
DURATION:	January-March 1978
CONTACT:	Professor G.C. Lalor, Pro-Vice-Chancellor, University of the West Indies, Mona, Kingston, Jamaica

DESCRIPTION:

In January 1978 the University of the West Indies, prompted by a desire to reduce the costs while increasing the quality and outreach of education, entered into a two-month experimental telecommunications program, "Project Satellite." The problems associated with delivering information over large distances to scattered islands in the Caribbean region made satellite communication a particularly inviting option.

The Mona Campus in Jamaica and the Cave Hill Campus in Barbados, as well as a non-campus site in St. Lucia, were linked through the ATS-6 satellite. The St. Augustine Campus in Trinidad participated in the early planning stages, preparing lessons which were later aired from Jamaica. Low-cost, roof-type receiver/transmitter dishes were installed at each site, providing for audio and video transmission through ATS-6 and an interactive audio capacity through ATS-3.

Planners agreed that "Outreach Programs"--a special form of adult education involving the transfer and exchange of knowledge, techniques, and technology between the university and the community--would be the main content of the telecast. Twenty-seven televised programs in color, totaling 34.5 hours, were organized and produced by the University of the West Indies staff, with coordination among a diversity of institutions, among them the Goddard Space Center and the University of Miami.

RESULTS:

Fifty-one percent of the television time was dedicated to Outreach Programs, which included developments in rural medical care in the Caribbean, agricultural research in rural areas, the value of the Nurse Practitioner Program to rural clinics, family-life education programs in the schools, early childhood education (community-oriented attitudes, services, and research), and coordination of University Center libraries. In addition to the Outreach Programs, seven course lectures in a variety of disciplines were transmitted and interactive teleconferences took place.

Great enthusiasm was generated by the projection of the university to non-campus territories through two seminars offered at St. Lucia. One seminar brought together food producers and professional agriculturalists in discussions concerning improved food production. The second seminar brought together participants from the West Indies, the United States, Holland and the United Kingdom to work toward a Caribbean model of education for the deaf. Panels at Mona, Cave Hill, and Barbados reacted to papers presented by conference participants, and there were general interactive discussions.

OF NOTE:

- One teleconference centered on solar energy and was made possible through a link-up with the Solar Energy Research Institute in Denver, Colorado.

- A special radio conference was held to demonstrate communication links over extremely large distances. The Mona and Cave Hill campuses of UWI held exchanges with PEACESAT sites at Wellington, New Zealand; Suva, Fiji; Niue Island; Rarotonga; Honolulu; Tarawa; and Santa Cruz, California. The link-up between the ATS-1 satellite used by the PEACESAT group and ATS-3 used by UWI was via Denver, Colorado.

REFERENCES:

"Project Satellite Report," by G. C. Lalor, University of the West Indies, Jamaica, June 1978.

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April 1979

SATELLITE INSTRUCTIONAL TELEVISION EXPERIMENT (SITE)

India

TARGET AUDIENCE:	2,400 remote villages no larger than 3000 people each, in six clusters in as many Indian states
OBJECTIVES:	To assess the effectiveness of television as an educational medium for rural Indian populations and the capacity of Indians to produce programming
MEDIA:	Television via satellite to community earth stations as well as through rebroadcasting; radio; print materials; face-to-face contact
DONORS/SPONSORS:	Indian Space Research Organization (ISRO), All India Radio (AIR), U.S. National Aeronautics and Space Administration
DURATION:	With satellite, one year (August 1975-July 1976); parts of the project ongoing
CONTACTS:	Professor E.F. Chitnis, Space Applications Center, ISRO, P.O. Bag 11, Jodphur Tekra, Ahmedabad 380909, India; P. V. Krishnamurthy, Director General, Doordarshan, New Delhi, India

DESCRIPTION:

On August 1, 1975, India began a massive experiment to use instructional television as a tool for national development with its rural populations. Following six years of planning with the U.S. National Aeronautics and Space Administration (NASA), the ATS-6 satellite, lent by NASA, was moved over the Indian Ocean, where for one year its "footprint" covered six of India's 22 states. The Indian Space Research Organization (ISRO) was responsible for the ground segment of the Satellite Instructional Television Experiment (SITE), including village selection; development, installation, and maintenance of community TV receivers; programming; and evaluation. Educational programming concentrated on national integration, upgrading and expanding education, health, nutrition, population, and agriculture.

The programs were received by 2,400 villages in six "clusters." Each cluster had one principal maintenance center and three sub-centers, responsible for servicing the community TV receivers. Participating villages generally had electricity, were within a radius of 40 km from a maintenance center, were approachable by jeep during most of the year, and had a suitable public building which could house the TV set. As an experiment, 150 battery-operated sets were installed in one state. Programs were transmitted twice a day--one and one-half hours in the morning for school educational programs, and two and one-half hours in the evening for general audiences. Programs were broadcast in four languages.

The education enrichment programs for children concentrated on strengthening language and mathematical skills at the primary and pre-primary levels, which in India suffer a high drop-out rate. Evening programs provided non-formal education, mainly in agriculture and health, to village communities. All programs transmitted were generated in India for the SITE project, most of them by the TV production unit of All India Radio. They were videotaped in special studios in Delhi, Cuttack,

and Hyderabad, using such formats as chorus song, quiz-in-verse, play opera, group dance, live action, simple animation, documentary films, and photo features. ISRO's Space Applications Centre produced 33 hours of science programs for transmission during the morning education hours, with the National Council of Educational Research and Training producing 13 films and conducting sessions to train primary school teachers in science, emphasizing the scientific method and encouraging classroom experimentation. With the exception of the latter effort, program support and utilization efforts were extremely limited.

RESULTS:

Children in TV classrooms showed significant increase in language development; TV apparently did not have the desired effect on school enrollment or absenteeism figures. The average audience for the evening programs was about 100 people per TV set, or about 200,000 nationally, with small farmers and landless laborers forming the majority audience. More males than females reported viewing. In general, the experiment had greater impact on lower castes, illiterates, females, low income groups, and those who reported regular viewing. There were statistically significant gains in health, family planning, political information, and overall modernity. There was no measurable gain in agricultural knowledge (partly due to the region specificity of such practices).

OF NOTE:

- Development of SITE hardware began in 1970, software not until 1974. The total project effort took 3,300 person years, of which 2,050 went to hardware and only 850 to software. Eighty-two percent of the costs were incurred on hardware, 9 percent on software.

- Thirty-four days before SITE broadcasts were scheduled to start, Indira Gandhi declared an Internal Emergency which involved the full censorship of all media; many of the news segments were used to transmit information on the emergency.

- An important part of the experiment's design was an attempt to dub two sound tracks on a single audio program for paired neighboring states that spoke different languages.

- The village TV set was augmented with a special antenna and a pre-amplifier converter; total cost of the set, manufactured in India, was around $1,000.

REFERENCES:

"Planning for Satellite Broadcasting: The Indian Instructional Television Experiment," by Romesh Chander and Kiran Karnik, UNESCO, 1976.

"The Indian Satellite Instructional TV Experiment: Its Origins, Organization, Messages, and Effects," by Bella Mody.

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APPALACHIAN EDUCATION SATELLITE PROGRAM

United States

TARGET AUDIENCE:	Residents of the 13-state Appalachian region of the United States. Projected, an additional 18 million cable TV subscribers nationwide
OBJECTIVE:	Initially, to test the effectiveness of satellite broadcasts as an alternative education delivery system for in-service professional and paraprofessional training. Projected, to provide community service programming to underserved areas through a self-supporting public service satellite network
MEDIA:	Satellite, television, video, 2-way audio, interpersonal communication, print materials
DONORS/SPONSORS:	Appalachian Regional Commission, U.S. National Aeronautics and Space Administration, National Institute of Education
DURATION:	Planning began in 1971, NASA satellite transmission in 1974; conversion in 1979 to commercial satellite
CONTACTS:	Harold Morse, Director, AESP, Appalachian Regional Commission, 1666 Connecticut Avenue, NW, Washington, D.C. 20235, USA; Nofflet Williams, Director, Resources Coordinating Center, AESP, University of Kentucky, Lexington, Kentucky 40506, USA

DESCRIPTION:

In 1972, when the Appalachian Regional Commission was looking for ways to provide accessible in-service teacher training to remote, mountainous, and poor areas, NASA was providing access to its ATS satellite series for experiments in public service communication. To test this technology, the Appalachian Education Satellite Program (AESP), with funding support from the National Institute of Education, broadcast education courses to receiving sites in 15 communities. The program has now broadened its community receiving sites to 45 in 13 states, providing university courses at the undergraduate and graduate levels and short workshops in education, human resources and services, medicine and health, business and industry, and government.

Receiving sites are located in community educational or medical institutions and operated by coordinators who are paid from revenues generated by the program. Classes meet weekly at the receiving site and typically consist of an hour of transmitted televised material plus two hours of group and individual activities, led by a course monitor, using printed course materials. During the 14-unit course, four live seminars are conducted, using one-way video signal (ATS-6) and two-way audio signal (ATS-3), to give students the opportunity to talk with experts and practitioners.

Programming needs and selection are determined by a variety of local committees that are also responsible for follow-up evaluation. This ensures local

participation and grass roots support for the program. An example of a collaborative effort in programming is the highly successful college-level course, "Teaching the Young Handicapped Child: An Overview," jointly developed by Project PUSH (Parents Understanding Student Handicaps), West Virginia's Mineral County Board of Education, and AESP. All such courses and workshops charge a tuition fee that is shared by AESP with the participating institutions. Funding from NIE will end in 1982, by which time AESP expects to be fully self-supporting.

RESULTS:

The first phase of the AESP program offered four graduate-level education courses. Following this successful demonstration, needs assessment and program planning resulted in a greatly expanded outreach effort to provide communities with specifically targeted programming. The number of regional receiving sites has increased steadily. In 1979 there will be 60 participating communities.

The years of successful programming with NASA's experimental satellites have given AESP the necessary experience in administration and delivery to continue its public service programming using commercial satellite. AESP's non-profit corporation, the Community Service Network (CSN), has contracted for 2000 hours per year on RCA's SATCOM-1 (approximately 30 hours per week), beginning in 1979.

A new element of the delivery system will be the addition of a potential 18 million viewers via the nationwide cable television network, which included 1,275 earth stations in 1979 and projects 2,500 stations by 1981. The CSN hopes to be able to generate $180,000 per month by adding a monthly charge of $.01 to cable television subscriptions for its public programming service.

OF NOTE:

- AESP is one of the few educational experiments to date to make the successful transfer from experimental to commercial satellite.
- In 1978, 1,469 persons enrolled in nine courses offered by AESP via satellite. College credit for these courses was granted by 52 colleges and universities in Appalachia. Thirty workshops were offered in which a total of 7,700 persons enrolled.
- A budget of $3,106,667 was projected for fiscal year 1979, of which $1,875,415 was provided by a grant from the National Institute of Education.

REFERENCES:

"Technical Reports" numbers 2, 4, 5, 11, 18, 21, 24, edited by the RCC Evaluation Component of the Appalachian Education Satellite Program, University of Kentucky, Lexington, Kentucky.

"Synopsis: Appalachian Education Satellite Program," by the Appalachian Regional Commission.

"Appalachian Education Satellite Program Operational Plans, 1979-1983," by the Appalachian Education Satellite Program, 1979.

"The Community Service Network," by the Appalachian Education Satellite Program.

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ALASKA EDUCATION DEMONSTRATION: ATS-6

United States

TARGET AUDIENCE:	Primary school students, teachers, and residents in 18 isolated Alaskan villages
OBJECTIVE:	To gain experience in designing and implementing a satellite communication system to bring services to isolated communities
MEDIA:	Satellite, television, videotape, print materials, interpersonal communication
DONORS/SPONSORS:	The Governor's Office of Telecommunications (GOT) of the State of Alaska; U.S. National Aeronautics and Space Administration, U.S. Department of Health, Education, and Welfare
DURATION:	Preliminary work began in 1972; actual program transmission in the ATS-6 demonstration project fall 1974-May 1975
CONTACT:	Robert Walp, Director, Governor's Office of Telecommunications, Pouch AC, Juneau, Alaska 99811, USA

DESCRIPTION:

The Governor's Office of Telecommunications (GOT) entered into the ATS-6 education experiment to determine the extent to which satellite communication could contribute to the delivery of educational services to isolated Alaskan villages, many of which have school programs only through the sixth grade. NASA allocated 4 hours and 45 minutes per week of satellite transmission time to the experiment, beginning in the fall of 1974 and ending in May 1975. Programming efforts were concentrated in oral language development and health education for elementary school students, in-service teacher training, and a topical "magazine" series for adults.

Some 150 hours of satellite programming were developed and transmitted to 18 isolated villages, 14 of which could receive video and receive and transmit audio, and four of which could receive and transmit both video and audio. Sites were selected in consultation with the Indian Health Service, the agency participating in the companion health service delivery experiment. Consumer Committees--representative groups of site-village residents, teachers, and administrators--participated actively in program and production decisions. A part-time utilization aide was recruited from each site community to coordinate program activities.

The Basic Oral Language Development (BOLD) program for four-to-seven-year olds was a 32-program series transmitted weekly, using a combination of human and puppet characters to establish repetition drills for the teacher or aide to reinforce in the classroom. The health education program was a 64-program series transmitted twice weekly. Thirty-two original programs focused on health habits, health attitudes, and general knowledge of the body and its functions; 32 prepackaged films reinforced the week's topic. Both the BOLD and original health

programs, developed by the Northwest Regional Educational Laboratory, used 20 minutes of programming followed by a 10-minute interaction period.

The Alaska Native Magazine (ANM) was a weekly one-hour evening program for adults, with topics selected by a Consumer Committee. The program was hosted by an Alaskan native and used film clips, mini-documentaries, and news features filmed at participating sites. Programs were transmitted in English, with simultaneous translations in two native Alaskan languages. There was, however, only one audio channel available at each site. Interaction with the program host was a part of the format.

The in-service training programs were aimed at teachers, administrators, and paraprofessionals. One program provided training for local community library personnel, using a previously prepared correspondence course and interactions between the studio teacher and students at remote sites. Another program was a commercially available series of filmed lectures on motivating students.

RESULTS:

Program attendance for the BOLD and health education programs averaged 44 students and 3.5 adults per site; for the Alaska Native Magazine program, 17 adults and 12 children per site; for the in-service program, 1.3 adults per site. Participants tended to be reluctant to use the interactive mode at first, then warmed to it as they became more familiar with the project and its personnel. The Alaskan language channels were reportedly used very infrequently, partly because of dialect differences. This points up one of the major problems of programming for Alaska: the rural native population is only 40,000 or 50,000 individuals, representing three ethnic backgrounds, with five languages and 20 dialects. It is thus difficult to develop cost-effective, regionally appropriate programming.

Although results of the demonstration were not decisive or striking, the administrative, technical, and interactive lessons learned were to prove helpful when Alaska instituted an operational system using the RCA SATCOM satellite. Participants and evaluators stressed the need for: high-quality audio transmission (ATS-1 proved unsatisfactory in this regard); simultaneous translation of programs in major languages and dialects, and individual access to audio channels; a statewide satellite footprint; adequate lead time for all phases of a project; field pretesting of programs; program development coordinated from design through production; involvement of the site community in program design and production; mangement of educational programs by a statewide education organization; and intensive involvement of local educators in program content and format.

REFERENCES:

"A Synthesis of the Final Reports and Evaluations of the ATS-6 Satellite Experiments in Education, Health and Telecommunications," by Robert T. Filep and Patricia A. Johansen, prepared for the Agency for International Development, February 1977.

"A Case Study of the ATS-6 Health, Education, and Telecommunications Projects," by Bert Cowlan and Dennis Foote, AID Studies in Educational Technology, August 1975.

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TELEMEDICINE IN ALASKA

United States

TARGET AUDIENCE:	Eskimo, Indian, and Aleut villagers
OBJECTIVES:	To improve access to and quality of health care in rural Alaska
MEDIA:	ATS-1--two-way satellite radio; ATS-6--satellite-TV; videotapes; computerized health records
DONORS/SPONSORS:	U.S. Department of Health, Education, and Welfare (the Indian Health Service, the Lister Hill National Center for Biomedical Communication); U.S. National Aeronautics and Space Administration
DURATION:	ATS-1 began in 1971; ATS-6 experiment began in 1974, ended one year later, then video reinstated until ATS-6 ceases transmission; operational audio system uses RCA's SATCOM
CONTACTS:	Dr. Martha Wilson, Alaska Area Native Health Service, Box 7-747, Anchorage, Alaska 99510, USA; Dr. Edwin B. Parker, Institute for Communication Research, Stanford University, Stanford, California 94305, USA; Dr. Heather Hudson, Academy for Educational Development, Inc., 1414 22nd St., N.W., Washington, D. C. 20037, USA

DESCRIPTION:

Experiments in the use of telemedicine in Alaska began under the auspices of the Indian Health Service. Faced with the problem of servicing scattered small villages in remote regions and thwarted by the lack of reliable communication channels in the bush, the agency turned to telemedicine in the hope that consultation on a regular basis would improve village health services.

Telemedicine became a part of daily life for 17 villages in the Tanana region when the National Aeronautics and Space Administration made the ATS-1 satellite available in 1971. The ATS-1 was a voice-only communication medium supported by simple and inexpensive ground equipment: modified taxicab radios and ten-foot diameter antennas of metal mesh. By providing reliable communication channels between villages and the district hospital, the ATS-1 functioned as a medical support system, enabling village health aides to provide health-care services under a doctor's supervision and to call for emergency planes to evacuate patients in critical condition.

Village health aides, the mainstay of telemedicine in Alaska, are nominated by their communities and trained by the Public Health Service. Each aide leaves the intensive training course equipped with a drug kit, a diagnostic reference manual, and instruments. In the ATS-1 phase, the aide turned on the radio at a scheduled time each day to receive a "doctor call" from the regional hospital. During the radio consultation, the aide reported symptoms, answered the doctor's request for more information, received professional advice, and helped the consulting doctor determine whether the patients in question needed to be evacuated.

Health aides played only a minor part in the one-year ATS-6 experiment carried out in 1974-75. The ATS-6 experiment added a video component that enabled doctors to diagnose difficult cases by using TV. The experiment linked two well-equipped clinics in fairly large villages to a field hospital and a referral hospital. At the same time, a problem-oriented computerized medical record system (the Health Information System) was established in Alaska to accommodate the state's highly mobile population. Up-to-date records of patients were collected at a central point, computerized, and made available at all sites; the computer also enabled itinerant nurses to identify villagers who needed routine tests and examinations.

RESULTS:

Since the introduction of the ATS-1, the capacity of existing health facilities to handle emergency cases, solve administrative problems, and answer requests has increased, and service has improved. Villagers demonstrate an increased willingness both to seek medical advice and to follow prescribed treatments. More patients now receive the benefit of a doctor's advice and more are treated for diagnosed ailments than ever before. Moreover, the number of contacts between doctors and health aides increased by 400 percent during the first year of the experiment. Most evaluations of the ATS-1 experiments have been positive, and, partly as a result of these evaluations, the State of Alaska and the Public Health Service have continued the two-way voice communication through a commercial satellite system.

The ATS-6 experiment was also deemed worthwhile by the health-care providers who took part in it, although many doubted that the improvements made possible by the video link were worth the expense. These same people approved unanimously of the problem-oriented computerized system of record-keeping that was developed in conjunction with the experiment. The Health Information System, now called the Patient Care Information System, currently uses computer-generated microfiche, updated every two weeks; it will include virtually all Alaskan native residents by summer 1979.

OF NOTE:

- Besides appreciating its medical function, villagers value the radio system as a means of keeping in touch with other villages, particularly with friends and relatives who are hospitalized.

- When asked if they had learned anything in particular from listening in on consultations, six of the nine health aides in villages with satellite link-ups mentioned specific health facts. None of their counterparts in the control villages could recall specific information related to cases.

REFERENCES:

"An Evaluation of the Use of ATS-1 for Biomedical Communication in Alaska," by Oswaldo Kreimer and others, Institute for Communication Research, Stanford University, 1974.

"Telemedicine: Health Care for Isolated Areas," by Dennis Foote, Development Communication Report, No. 17, January 1977.

"Telemedicine in Alaska: The ATS-6 Satellite Biomedical Demonstration," by Dennis Foote, Edwin Parker, and Heather Hudson, Institute for Communication Research, Stanford University, 1976.

"Medical Communication in Alaska by Satellite," by Heather Hudson and Edwin Parker, New England Journal of Medicine, December 1973.

SATELLITE TECHNOLOGY DEMONSTRATION (STD)

United States - Rocky Mountain States

TARGET AUDIENCE:	Various audiences in rural and isolated sites in Colorado, Idaho, Montana, New Mexico, Utah, Wyoming, Arizona, and Nevada (one-fourth of the total area of the United States)
OBJECTIVE:	To explore the use of satellite technology in the delivery of educational services to isolated rural populations
MEDIA:	Television transmitted via satellite; print; film; videotape; local follow-up in schools
DONORS/SPONSORS:	Federation of Rocky Mountain States; U.S. National Aeronautics and Space Administration; U.S. Department of Health, Education and Welfare
DURATION:	One year (summer 1974-summer 1975)
CONTACTS:	There is no available contact for the STD experiment, as the Federation of Rocky Mountain States has been subsumed under the Western Governors' Conference.

DESCRIPTION:

The Satellite Technology Demonstration (STD) was one of six experiments conducted in 1974-75 to explore the use of satellite technology in the delivery of health and education services in rural areas of the U.S., using NASA's ATS-6 satellite. The Satellite Technology Demonstration was an education project sponsored by the Federation of Rocky Mountain States. A total of 68 receiving stations were established for the project, 56 in rural schools. Three terminals in each of the eight project states could receive video and receive and transmit audio signals. Thirty-two of the sites had receive-only TV terminals. In addition, 12 public television stations received satellite transmissions for relay to homes in their viewing areas.

The STD designed and produced three original program series. The first, "Time Out," was a junior high school career education course broadcast daily and was considered the most important programming effort. Support for the series included a teachers' guide, monthly program schedules, and the administrative support of a local site coordinator. The second, "Careers in the Classroom," was an in-service training series for classroom teachers, consisting of 16 programs broadcast every other week. College credit for the course was offered by several institutions. The evening program series, "Footprints," consisted of ten 50-minute programs on topics of interest to the rural community. All three series used basically the same format: an exposition of the topic, either in a "magazine," live lecture, or pre-recorded form, followed by a period of "live" interaction involving the two-way audio sites. Receive-only sites could observe the latter portion but could not participate.

A fourth component of the STD was the Materials Distribution Service, which established a library and catalog of 400 commercial educational films and videotapes, pre-selected by the teachers, to be made available via satellite for

videotaping and later use. The films were leased from the Encyclopedia Britannica Educational Corporation and the Great Plains National Instructional Television Library.

RESULTS:

The majority of the junior high viewers of "Time Out," a captive audience, reported that they would like to see the career-education class continued; there were minimal test score gains recorded from their having viewed the programs. Teachers thought the "Time Out" series too long. They indicated a preference for enrichment programs rather than mediated instruction. Teacher response to the in-service course was mildly positive, most of those attending being motivated by college credit or recertification requirements. Over 500 teachers received credit for the course; 322 received recertification credit. The "Footprints" programs were the least successful series, with overall attendance reported as "disappointing." While those who viewed the programs were positively disposed toward them, there was no institutional support system to attract a larger audience.

Most teachers considered the Materials Distribution Service the most successful part of the STD project, the major drawback being equipment limitations for videotaping, as this equipment was not provided by STD. Schools were not pleased that copyright provisions prevented STD from providing the films on a permanent basis. Another problem emanated from the fact that the interaction component required real-time viewing. Many schools objected to having to schedule all of their activities around STD broadcast schedules.

In general, the project, particularly the programming, suffered from a shortage of planning time and from trying to comply with changing federal guidelines. As in many early satellite projects, software took second place to hardware, and evaluators emphasized the need to concentrate more on program content and pretesting in future projects. The project did demonstrate that a satellite distribution system for educational programs is technically feasible.

REFERENCES:

"A Synthesis of the Final Reports and Evaluations of the ATS-6 Satellite Experiments in Education, Health, and Telecommunications," by Robert T. Filep and Patricia A. Johansen, prepared for the Agency for International Development, February 1977.

"A Case Study of the ATS-6 Health, Education, and Telecommunications Projects," by Bert Cowlan and Dennis Foote, AID Studies in Educational Technology, August 1975.

Clearinghouse on Development Communication
April 1979

WAMI REGIONALIZED MEDICAL EDUCATION EXPERIMENT

United States

TARGET AUDIENCE:	For the university phase: students, faculty, and administrative personnel of the Universities of Alaska and Washington. For the community phase: faculty and residents at the University of Washington Medical School, and the health personnel of the Family Medical Center of Omak, Washington
OBJECTIVES:	To test satellite technology as a means of providing decentralized medical education among universities and to rural health clinics
MEDIA:	Satellite, television (two-way audio, two-way video), telephone, interpersonal communication and classroom lectures
DONORS/SPONSORS:	The Universities of Washington and Alaska; the U.S. National Aeronautics and Space Administration (ATS-6); the Canadian Department of Communications and NASA (Hermes/CTS); the National Library of Medicine
DURATION:	The WAMI Program was organized in 1970; it used ATS-6 from 1974 to 1975 and Hermes/CTS from 1977 to 1979
CONTACTS:	John L. Boor, WAMI Program, School of Medicine, University of Washington, Seattle, Washington 98195, U.S.A.; Dr. Charles Dohner, Office of Research, School of Medicine, University of Washington, Seattle, Washington 98195, U.S.A.

DESCRIPTION:

The WAMI (Washington-Alaska-Montana-Idaho) regionalized medical education program was initiated in 1970 in an attempt to alleviate enrollment pressures on the University of Washington Medical School, the only medical school in that four-state area. By decentralizing first-year medical course work and conducting third and fourth year clinical training in rural communities, the WAMI program sought to increase access to medical education and encourage medical graduates to return to small communities to practice.

Beginning in 1974, the ATS-6 satellite offered the opportunity to experiment with ways to reinforce the WAMI program's education and community service roles. The university phase of the experiment focused on curriculum design, administration, and patient care involving the medical school at the University of Washington (UW), and the University of Alaska. This phase used the only full duplex capability (both video and audio from the two sites) in the entire ATS-6 series of experiments. In all, there were 34 telecasts of 75 minutes each between the two sites.

Curriculum development efforts were directed at enrichment of basic science courses and specialized study courses. Five administrative conferences were held between either faculty or administrators to test the feasibility of distance

decision-making. A series of dermatological consultations was held to evaluate patient care via teleconsultation.

The clinical phase of the experiment involved the transmission of 20 programs of 75 minutes each between the UW Medical School and the Family Medical Center in Omak, Washington. Students, who did training at the Omak Clinic on a rotating basis, presented case studies which they discussed with UW faculty. Programs on patient care were presented by faculty, and Omak personnel prepared programs on rural and emergency health care. Mental health teleconsultations were incorporated in the clinical phase.

Building on the limited initial ATS-6 experiments, the WAMI program broadened its site reach with Hermes/CTS by linking three university and six community clinics. This linkage now allows for basic science courses taught at UW to be sent to the University of Alaska and Montana State University. Further experiments will test the feasibility of administering admissions tests and doing minority recruitment via satellite. Additional programs aim at supporting the rural practitioner by providing continuing medical education and consultation and diagnostic support.

RESULTS:

Evaluation of the nine month ATS-6 segment of the WAMI Program showed that medical teaching can be effective using satellite transmission. However, interviews conducted via satellite for medical school admission were not as successful as face-to-face meetings; an increased familiarity with the medium may put participants more at ease and make satellite interviews more effective. Clinical exchanges with UW faculty were considered especially effective for student/resident education. The Hermes/CTS experiment is expected to give a broader base for evaluating specific communication requirements for regional education. Preliminary data suggests that carefully planned and controlled use of telecommunications for medical education and distance-clinical support will reduce costs and be effective.

OF NOTE:

- Administrative decisions via teleconference were made more quickly and efficiently than in in-person meetings.
- When vast distances must be bridged, shared educational facilities can substantially reduce costs when the appropriate technology--in this case a satellite--is used.

REFERENCES:

"A Synthesis of the Final Reports and Evaluations of the ATS-6 Satellite Experiments in Education, Health, and Telecommunications," by Robert T. Filep and Patricia A. Johansen, prepared for the Agency for International Development, February 1977.

"Communications Technology Satellite (Hermes)," Proceedings of the Joint United States-Canadian Experiments Meetings, Wingspread, Racine, Wisconsin. 1978.

"Satellite Technology Improves Medical Education," by M. Roy Schwarz and Marion H. Johnson, in Hermes (The Communications Technology Satellite): Its Performance and Applications, Volume I, Ottawa. Canada, 1977.

VETERANS ADMINISTRATION HEALTH COMMUNICATIONS EXPERIMENT ON ATS-6 AND HERMES/CTS

United States

TARGET AUDIENCE:	Physicians, patients, and patients' families at Veterans Administration hospitals in isolated regions with poor communications. ATS-6 linked 10 hospitals in Appalachia; Hermes/CTS linked 29 hospitals in the Rocky Mountain and Pacific Coast regions, including Alaska
OBJECTIVES:	Under ATS-6, to determine if satellite television transmission was a cost-effective medium for medical consultations and continuing medical education. Under Hermes/CTS, to provide a broader look at cost-effectiveness, impact on patient care, improved administrative and educational techniques
MEDIA:	Satellite, television, telephone, video, film, interpersonal communication, print materials
DONORS/SPONSORS:	Veterans Administration, U.S. National Aeronautics and Space Administration (ATS-6), Canadian Department of Communications and NASA (Hermes/CTS)
DURATION:	On ATS-6, 1974-75; on Hermes/CTS, 1977-79
CONTACTS:	Robert Shamaskin, Deputy Director, Learning Resources Service, Veterans Administration Central Office, Washington, D. C. 20420

DESCRIPTION:

The Veterans Administration, faced with problems of providing quality medical care throughout its widespread system of 171 hospitals and 212 outpatient clinics, was eager to test the capabilities of satellite communications to link its remote hospitals to the high technology of major hospital centers. Ten hospitals in the Appalachian "footprint" of ATS-6 were selected for this test.

An Education Coordinating Committee was set up to make a needs assessment and determine feasible programs. Some 75 subjects were chosen, and 90 hours of broadcast time were developed and presented over a period of eleven months, using five different "events."

The video seminars used one-way video to broadcast prepared video or film material, in conjunction with two-way telephone exchange between faculty at the program's studio in Denver and audiences in the ten participating hospitals. Study guides provided supplemental material.

Grand rounds, originally intended to be live hospitals rounds, became, because of technical difficulties, a discussion of patient case histories among the hospitals and Denver-based faculty.

The outpatient clinics followed the format of the video seminars but provided the information and follow-up discussions to patients about their own illnesses.

Teleconsultations were one-way video, two-way audio exchanges between the Denver faculty and one originating hospital that had prepared videotape material on specific diagnostic and case management problems. There was an attempt to use slow-scan video to send visual information to the studio, but the picture quality was deemed poor.

Three hospitals participated in activities linking computer systems via the satellite, but this experiment was marred by technical difficulties.

The ATS-6 experiment ended in 1975. When access to the joint Canadian Department of Communications and NASA Communications Technology Satellite (CTS), or Hermes, was offered, the Veterans Administration began planning a new series of experiments covering 29 hospitals in the western United States. Most of the initial experiments are being continued, in an expanded or altered form, with the goal still to provide diagnostic support, continuing education, patient education, and training in management and administrative skills. It is hoped to demonstrate through Hermes that expensive diagnostic equipment can be shared by a number of institutions.

RESULTS:

The Veterans Administration ATS-6 experiment had an evaluation component built in which showed strong support for the program by hospital users, and the experiment as a whole created a climate of acceptance of innovation. For example, physicians' enthusiasm for the ten teleconferences suggests a strong potential for further development of this technique.

Throughout the broadcast period the number of participants in the programs remained stable. Video seminars had the highest number of attendees, and a climate of camaraderie reportedly resulted in improved morale on the part of hospital staffs. Videotaped material was widely used and seemed to increase the use of other material.

OF NOTE:

- The evaluation showed that nurses were more receptive to the programming than were physicians.
- The prepared videotapes were so popular that their use spread to other VA hospitals.
- Attendance at the 37 video seminars averaged about 400 per program.

REFERENCES:

"A Synthesis of the Final Reports and Evaluations of the ATS-6 Satellite Experiments in Education, Health, and Telecommunications," by Robert T. Filep and Patricia A. Johansen, prepared for the Agency for International Development, February 1977.

"Medical Applications to Communications Satellites," by Robert B. Shamaskin, in Hermes (The Communications Technology Satellite): Its Performance and Applications, Volume I, Ottawa, Canada, 1977.

"The Veterans Administration Experiment with the Applications Technology Satellite-6: Final Report," Washington, D. C., February 1976.

UNIVERSITY OF QUEBEC OMNIBUS NETWORK

Canada

TARGET AUDIENCE:	The University of Quebec community
OBJECTIVE:	To experiment with new communication channels between units of the university's network of institutions
MEDIA:	Satellite television, one-way video, two-way audio, classroom instruction
DONORS/SPONSORS:	Department of Communications (Canada), University of Quebec
DURATION:	October 1976 to March 1977
CONTACTS:	Pierre Dumas, University of Quebec, St. Foy, Quebec, Canada; Louis Bruñuel, Vice Rector of Communications, University of Quebec, St. Foy, Quebec, Canada; Robert Dupuy, University of Quebec, St. Foy, Quebec, Canada

DESCRIPTION:

In 1976 the University of Quebec (UQ) began participating in a diversified satellite research project, the Omnibus Network, aimed at experimenting with new communication channels between units of the university's network of institutions. The geographical distribution of the seven-campus UQ community over 1,300 kilometers, as well as the university's mandate to extend access to courses through telecommunications, precipitated this interest in improved communication techniques. The project aimed at stimulating innovation in instructional research and administrative matters, determining the most suitable type of network for the multicampus university, assessing the effect of satellite communications on learning, and stimulating the development of technical and educational resources in the communications sector of the university. Between October 1976 and March 1977, 12 experiments occupying about 300 satellite hours were carried out autonomously by various groups in the UQ community.

The experiments were coordinated at the university's headquarters, particularly the technical aspects and scheduling. All other functions related to the development of individual experiments--including financing--rested with the professor, researcher, or campus sponsoring the particular project. Individual experiments used a varity of extender technologies, including telecopier, microscopes, and facsimile transmissions.

The experiments fell into several categories: scientific research, involving the transmission of data about the height of waves from a lighthouse at Metis Beach to a laboratory at Rimouski; community interaction, involving an exchange of recipes, folklore, and recollections between citizens at two distant points; teleconference, an experiment allowing scientists at distant points to observe and comment on pictures relayed by satellite from an electron microscope; teledocumentation, two experiments allowing students at one point to consult by satellite with librarians at another, and allowing librarians to talk to each other; teleteaching, several experiments covering a variety of approaches, from the classical lecture course to a more participative course with resource people at various points; refresher courses, allowing teachers near Quebec City to be linked by

satellite to a laboratory at Three Rivers; and telework, involving an exchange of documents by two-way video link over Hermes/CTS between the registrars' offices at Hull and Rouyn.

RESULTS:

The Omnibus Network, by encouraging innovation, revealed the needs of the UQ community and resulted in accelerating the institutionalization of a broadband video network connecting most of the constituents. It strengthened the UQ system by encouraging stronger links between communications and education, between research teams and the constituents, and among constituents themselves. In addition, students frequently reported better learning experiences in the satellite program than in traditional university sessions.

Although some technical deficiencies were reported--antenna instability, interface problems between satellite and terrestrial systems--participants for the most part were satisfied with the technical aspects of the project, particularly with the quality of transmissions. The reduced size of the ground stations allowed great flexibility in setting up communications links, with end points determined by users' needs. It was felt that the experiment made possible cost-beneficial communication over long distances and successfully linked locations that lacked terrestrial telecommunications facilities. Experimenters felt that others would take advantage of communications satellites to extend the reach of their services if the technology were accessible and the costs reasonable.

REFERENCES:

"Le Reseau Omnibus de l'Université de Québec," by Pierre Dumas, et al., in Hermes (The Communications Technology Satellite): Its Performance and Applications, Volume 1, Ottawa, Canada, 1977.

A Report on the Process of Implementation, by D. H. Jelly, Department of Communications, Ottawa, Canada, July 1978.

The Hermes Communications Technology Satellite Project, by Anna Casey-Stahmer, an Information Paper submitted to the Agency for International Development, Washington, D.C., January 1977.

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UNIVERSITY OF WESTERN ONTARIO TELEMEDICINE
(MOOSE FACTORY EXPERIMENT)

Canada

TARGET AUDIENCE:	Personnel of Moose Factory Hospital, a northern nursing station, and the University of Western Ontario Hospital
OBJECTIVE:	To provide improved medical access for residents of northern Canada by linking medical facilities there with the university hospital
MEDIA:	Satellite, television, one-way video, two-way audio
DONORS/SPONSORS:	Federal Departments of Communications and of Health and Welfare (Canada); Department of Diagnostic Radiology and Nuclear Medicine at the University of Western Ontario, London, Ontario
DURATION:	October 1976 to February 1977
CONTACT:	Dr. Lewis S. Carey, Department of Diagnostic Radiology and Nuclear Medicine, University of Western Ontario, London, Ontario, Canada

DESCRIPTION:

The Moose Factory Telemedicine Experiment (U-6) used the communications facilities of the Hermes experimental satellite to link a small hospital and a nursing station in northern Canada with the University of Western Ontario Hospital in London, Ontario. Because of the severe climate and the transportation and communication constraints imposed by distance and ionospheric conditions, the approximately 10,000 Cree Indians and Inuit residents of 19 villages of northern Ontario and northern Quebec had only limited access to medical services, depending almost entirely on the facilities of local nursing stations and one regional hospital. The U-6 experiment, begun in 1976 and operated from 8 A.M. to 12 noon every second day until February 1977, tested the Hermes spacecraft's ability to improve the Canadian situation by extending university-based medical services to the north. By providing communication between the isolated northern nursing station, the base hospital (Moose Factory), and the university hospital, the satellite facilitated discussions of diagnoses and patient management among the various levels of the health-care system. Reliable audio links between the nursing station and the base hospital allowed for the transmission of electrocardiograms (EKGs) and patient documents and the handling of administrative matters, and made it easier to obtain second opinions and make decisions about patient transfers. It also enabled families to keep in touch with hospitalized relatives.

The base hospital was equipped for one-way video transmission to the university hospital, as well as for voice, facsimile, electronic stethoscope, and EKG transmission. Cameras at the base hospital were remote-controlled from the university hospital.

RESULTS:

The experiment indicated that a telemedicine system can usefully support medical services and should complement, not replace, a program of visiting specialists. It also revealed the need for increased awareness of diseases and conditions of the north; for encouraging medical students to practice there; for upgrading skills--particularly technological--of northern nurses; and for exploring further the requirements for high quality image transmission.

On the whole, the response to transactions was positive, particularly to those involving diagnosis and patient management. Of the 211 transactions recorded in the nursing station-base hospital program, nurses rated 87.6 percent as good to excellent. Visual access provided by satellite transmission was particularly important in psychiatric transactions; in many cases, a patient's mannerisms played an integral part in the medical assessment.

The experiment paved the way for encouraging accreditation of remote health-care sites, for on-the-job continuing education, and for the training of native medical students in the north. The difficulties of travel and transportation in the north seriously affect the provision of medical care. The experiment showed that reliable communications can make a significant contribution to improving health-care delivery, effectiveness, and efficiency.

OF NOTE:

- The physician-population ratio in the north is 1:1490, compared with 1:613 in the south.
- In psychiatric transactions, the native patients were found to be less disturbed by the camera and the off-site voice than were the staff at the hospital.

REFERENCES:

"A Telemedicine Experiment in Canada, Utilizing Hermes," by Lewis S. Carey and Earl S. Russell, in Hermes (The Communications Technology Satellite): Its Performance and Applications, Volume I, Ottawa, Canada, 1977.

"The Moose Factory Telemedicine Project: A Descriptive Evaluation," by Robin S. Roberts, et al., in Hermes (The Communications Technology Satellite): Its Performance and Applications, Volume II, Ottawa, Canada, 1977.

The Hermes Communications Technology Satellite Project, by Anna Casey-Stahmer, an Information Paper submitted to the Agency for International Development, Washington, D.C., January 1977.

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MEMORIAL UNIVERSITY TELEMEDICINE

Canada

TARGET AUDIENCE:	Physicians and other health professionals in Newfoundland and Labrador, Canada
OBJECTIVES:	To determine the feasibility of delivering continuing education programs to physicians and other health professionals by satellite, and/or providing for consultations and transmitting x-rays and other medical data
MEDIA:	Satellite, television, one-way video, two-way audio, interpersonal communication
DONORS/SPONSORS:	Educational Television Center and Faculty of Medicine at Memorial University, St. John's, Newfoundland, Canada
DURATION:	July 1976 to March 1977
CONTACTS:	A. M. House, W. C. McNamara, and J. M. Roberts, Faculty of Medicine, Memorial University, St. John's, Newf., Canada

DESCRIPTION:

The focus of the Memorial University Telemedicine project was to use Hermes, the communications technology satellite, to deliver continuing education programs to physicians and other health professionals, allowing them to remain at their place of work and their tutors to remain at the university. A secondary focus was to provide for consultations and for the transmission of x-rays and other medical data. Administrative sessions and conferences of allied health-care personnel and hospital administrators were also facilitated. Four hospitals in Newfoundland and Labrador--in Stephenville, St. Anthony, Labrador City, and Goose Bay River--were linked to the Health Sciences Center of Memorial University. Programs included management meetings; demonstrations of slow-scan activities, a remote control camera, and other telemedicine systems; televisits between family and patients; and two conferences, one a symposium of physicians and pharmacists, the other a meeting of the Eastern Canadian Surgical Society. Computer print-outs informed audiences of the program schedule. Schedules were also announced at the beginning of each program.

Through one-way television and interactive audio-conferencing, tutors used the seminar format to involve the audience in the programs. Local program moderators assisted tutors by starting programs with informal conversation to enhance interaction and by ensuring that the audience had ample opportunity to speak during the program. Audience interaction was further facilitated by a system of tones and lights which signaled the moderator and tutor that someone wished to speak.

Consultation activities of the project consisted of extensive experimentation with the transmission of x-rays by slow-scan equipment between Labrador City and St. John's. Radiologists in St. John's read the films, using the patient history provided by the hospital in Labrador City. A few electrocardiograms were also transmitted using a slow-scan system.

RESULTS:

The Memorial University Telemedicine project was a feasibility study to explore the potential of communications satellites in medicine. It revealed that future experiments with broad- and narrow-band facilities are necessary to resolve questions about the most cost-effective methods in telemedicine. It is also recommended that health-care professionals conduct additional research in telemedicine to demonstrate its relevance to health-care delivery, in anticipation of the criticism that telehealth is merely "an expensive toy." Future projects should also focus more on the personal implications of utilizing telecommunications, as this will influence its adoption for health care and other public services.

On the technical side, the terminals were easy to install, required a minimum of interface equipment, and were simple to operate. At times, however, the project met with technical difficulties associated with power sources and terminal malfunctioning. There were also considerable problems with balancing the audio systems. On the whole, however, the experimenters felt that Hermes fulfilled much of its promise.

OF NOTE:

- Despite inconvenient program times involving conflicts with operating room schedules or nursing procedures on the wards, 250 people out of a potential maximum of 452 attended the programs at the four receiving sites.

- Memorial University carried out its activities via satellite because the system was offered at no cost. The same project would have been conducted had similar facilities been freely available on terrestrial communications systems.

REFRENCES:

"Memorial University of Newfoundland CTS/Hermes Experiment (P1)," A. M. House, M.D., Communications Technology Satellite (Hermes), Proceedings of the Joint United States-Canadian Experimenters' Meeting, Wingspread, Racine, Wisconsin, 1978.

"Memorial University Telemedicine Project," A. M. House, W. C. McNamara, and J. M. Roberts, Hermes (The Communications Technology Satellite): Its Performance and Applications, Volume 1, Ottawa, Canada, 1977.

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PROJECT INTERCHANGE: HERMES/CTS

United States

TARGET AUDIENCE:	Teachers and other education experts in California
OBJECTIVE:	To provide an information exchange among teachers involved in personalized and special education
MEDIA:	Hermes/CTS, television, film, videotape
DONORS/SPONSORS:	U.S. Department of Health, Education, and Welfare; individual members of the Public Service Satellite Consortium; U.S. National Aeronautics and Space Administration
DURATION:	February 1976 to Spring 1977
CONTACTS:	David Green and Bill Lazarus, Department of Education, Archdiocese of San Francisco, California, U.S.A.

DESCRIPTION:

Begun in 1976, Project Interchange used the Hermes/CTS satellite to form a communications bridge between geographically dispersed teachers involved in personalized and special education. The project, designed and controlled by teachers, was conducted in two phases, each involving teleconferences between faculty in the Archdiocese of San Francisco and the Torrance Unified School District (Los Angeles), and other educational experts in California.

RESULTS:

The first phase of the experiment resulted in the decision to move away from presentations by resource people, using instead exchanges among the teachers themselves. The second phase underscored the importance of closer direction of the discussions and more interaction between teachers and resource people. As a result of the experiment, Project Interchange staff are working with the Special Education Department of the University of Kentucky and the Council for Exceptional Children in Reston, Virginia, to develop a national plan for the application of communications satellites to special education.

REFERENCE:

"Project Interchange: A Work-In-Progress Report," by David Green and Bill Lazarus, in Hermes (The Communications Technology Satellite): Its Performance and Applications, Volume I, Ottawa, Canada, 1977.

CURRICULUM SHARING BY DIGITAL TV: HERMES/CTS

United States and Canada

TARGET AUDIENCE:	Students and faculty of Stanford University, California, and Carleton University, Ottawa, Canada
OBJECTIVE:	To provide for an exchange of courses between Stanford and Carleton universities
MEDIA:	Hermes/CTS, one- and two-way video, two-way audio, digital TV
DONORS/SPONSORS:	Department of Communications of Canada, U.S. National Aeronautics and Space Administration, Stanford University, and Carleton University
DURATION:	September 1976 to April 1977
CONTACTS:	Dr. Donald George, Faculty of Electronic Engineering, Carleton University, Colonel By Drive, Ottawa, Ontario K1A5B6, Canada; Dr. Ken Down, Faculty of Electronic Engineering, Stanford University, Palo Alto, California 94305

DESCRIPTION:

This experiment in tele-education via satellite involved an exchange of courses between Stanford University in Palo Alto, California, and Carleton University in Ottawa, Ontario, from September 1976 to April 1977. The satellite provided two-way television between the two institutions, using digital compression techniques on narrowband channels. Two modes of operation were available. In one, two-way audio and one-way video made it possible for students in remote locations to participate in classes. In the other, two-way audio and two-way video made teleconferences between Ottawa and Palo Alto possible. Carleton offered courses in digital systems architecture and computer communications systems; Stanford offered courses in management of research institutions, statistical signal processing, and data structures. Unlike other Hermes/CTS experiments, this one had Canadian and U.S. partners and was concerned with both new applications and new technology--advanced methods of digital television-signal processing, for which the Ames Research Center of NASA was responsible.

RESULTS:

Technical operations in the experiment went smoothly. Student reaction was also good, for the most part, although more refined methods of course management are needed. Most students indicated that they would attend television courses if they were interesting, up-to-date, and of higher quality. There is also a need for periodic student-teacher face-to-face conferences. The major difficulty of such tele-educational systems seems to be that of pairing universities with different academic traditions and student populations with different needs.

REFERENCE:

"Curriculum Sharing by Digital TV Using Hermes," by Larry B. Hofman and Donald A. George, in Hermes (The Communications Technology Satellite): Its Performance and Applications, Volume I, Ottawa, Canada, 1977.

INTERACTIVE BROADBAND COMMUNICATION NETWORK: HERMES/CTS

United States

TARGET AUDIENCE:	Health professionals in various regions of the United States
OBJECTIVE:	To experiment with applications of telecommunications technology in the health sciences
MEDIA:	Hermes/CTS, television, videotape
DONORS/SPONSORS:	The six health agencies of the U.S. Department of Health, Education, and Welfare
DURATION:	The experimental phase began in June 1977; experiments ongoing until June 30, 1979
CONTACT:	Earl Henderson, Lister Hill National Center for Biomedical Communications, National Library of Medicine, Bethesda, Maryland 20014, U.S.A.

DESCRIPTION:

The Public Health Service's Interactive Broadband Communication Network was an experimental national program designed to test the feasibility of using telecommunications for a variety of applications in health sciences in the United States. Programs included faculty resource sharing, continuing education for health professionals, dissemination of research results, and teleconferences. Project STARDATE, a program for dietitians, broadcast two nutritional workshops conducted by nationally recognized nutrition authorities to audiences of registered dietitians in Seattle, Denver, and Bethesda. Project NCAST, the nursing program, involved the dissemination of research about child-health assessment. The experiment utilized both television and videotape and was conducted in two stages, one in the eastern United States, the other in the west.

RESULTS:

These early experimental programs in the health sciences produced successful interactions between students and lecturers in the health courses, suggesting that such systems should be used for interactive transactions rather than for didactic lecture presentations which might be delivered equally well using another communications medium such as videocassette. Further experiments testing the application of satellite technology to programs within DHEW will continue through June 30, 1979.

REFERENCE:

"Interactive Broadband Communication Network for Health Education," by Earl Henderson, et al., in Hermes (The Communications Technology Satellite): Its Performance and Applications, Volume I, Ottawa, Canada, 1977.

PERSONNEL DEVELOPMENT BY SATELLITE: HERMES/CTS

Canada

TARGET AUDIENCE:	Public servants in Ontario and Newfoundland, Canada
OBJECTIVES:	To provide training courses for widely dispersed Canadian public servants
MEDIA:	Hermes/CTS, television
DONORS/SPONSORS:	Department of Communication, Canada; Public Service Commission of Canada
DURATION:	April 26 to June 19, 1977
CONTACTS:	Michael G. Ryan, Nicole N. Mendenhall, and Guy Jean, Staff Development Branch, Public Service Commission, 1725 Woodward Drive, Ottawa, Ontario K1S IN4, Canada

DESCRIPTION:

In order to fulfill its training and development mandate, the Public Service Commission (PSC) of Canada turned to satellite to reach public servants in Ontario and Newfoundland. The "Long-range Planning in Government" course, developed with the learners' cooperation, was conducted four times--once in simulation, twice by satellite, and once with a face-to-face control group. Each learning center was equipped with four monitors, each of which had a video feed from one of the four other centers. Each center also had a television camera and an open microphone audio system with headphones, thus participants were able to maintain continuous communication with any other group.

RESULTS:

The experiment demonstrated that an educational program such as this for public servants is technically feasible. Participants indicated a high degree of satisfaction with the course. A survey of PSC staff development managers indicated that future communications satellites could help train regional officers and civil servants in remote locations, help train Indian and Eskimo civil servants in management skills, and allow for joint ventures between the Canadian federal government and other national and international organizations.

REFERENCES:

"Personnel Development by Satellite," by Michael G. Ryan, et al., in Hermes (The Communications Technology Satellite): Its Performance and Applications, Volume I, Ottawa, Canada, 1977.

Clearinghouse on Development Communication
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WA-WA-TA SATELLITE RADIO PROJECT: HERMES/CTS

Canada

TARGET AUDIENCE:	Residents of four communities in northwestern Ontario, Canada
OBJECTIVE:	To test the feasibility of using satellite to link community radio stations in northwestern Ontario in a native Indian radio network
MEDIA:	Hermes/CTS, radio
DONORS/SPONSORS:	Wa-Wa-Ta Communications Society; Department of Communications, Canada
DURATION:	May 13 - September 15, 1978
CONTACT:	David Forse~, Program Consultant, Wa-Wa-Ta Communications, Sioux Lookout, Ontario, Canada

DESCRIPTION:

The Wa-Wa-Ta experiment was designed to test the feasibility of using satellite to link independent community radio stations in remote areas of northwestern Ontario in a native radio network. Wa-Wa-Ta, the native communications society of northern Ontario, established a main production center at Sioux Lookout, which was linked by satellite with community radio stations at Sandy Lake, Big Trout Lake, and Fort Hope. Sioux Lookout programming took the form of a newsmagazine; programs from the communities were a mixture of music and features. The experiment, supported by the Department of Communications (Canada), was conducted from May 13 to September 15, 1978.

RESULTS:

Questionnaires distributed to a sample of residents in each community, phone-in programs, and interviews with community radio officials and project staff indicated an enthusiastic response to the experiment. Although some minor difficulties were caused by dialect differences, the majority of listeners had no problem understanding the programs and were delighted to hear from other Indian communities in their own language. Eventually, community chiefs and elders used the satellite radio service for open public discussion of issues, thus providing for the exchange of ideas among residents of remote communities. The general conclusion was that the network capability should continue in some way.

REFERENCES:

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